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NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

04/05/2004

Mark R. Wisner
Wisner & Associates
1177 West Loop South Suite 400
Houston, TX 77027-9012

EXAMINER

TAYLOR, VICTOR J

ART UNIT

PAPER NUMBER

2863

DATE MAILED: 04/05/2004

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,090	02/22/2002	Ilyas Juzer Najmuddin	94.0048	2821

TITLE OF INVENTION: METHOD AND APPARATUS FOR DETECTING FRACTURES USING FREQUENCY DATA DERIVED FROM SEISMIC DATA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$0	\$1330	07/06/2004

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.

☐ Applicant claims SMALL ENTITY status.
See 37 CFR 1.27.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450**

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INSTRUCTIONS: This form should be used for transmitting the **ISSUE FEE** and **PUBLICATION FEE** (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

7590 04/05/2004

Mark R. Wisner
Wisner & Associates
1177 West Loop South Suite 400
Houston, TX 77027-9012

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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nonprovisional	NO	\$1330	\$0	\$1330	07/06/2004

EXAMINER	ART UNIT	CLASS-SUBCLASS
TAYLOR, VICTOR J	2863	702-002000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent); ☐ individual ☐ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:

- ☐ Issue Fee
- ☐ Publication Fee
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

Director for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature)	(Date)
<p>NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.</p> <p>This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Alexandria, Virginia 22313-1450.</p> <p>Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.</p>	

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

Notice of Allowability

Application No.

10/081,090

Examiner

Victor J. Taylor

Applicant(s)

NAJMUDDIN, ILYAS JUZER

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 16 March 2004.
2. ☒ The allowed claim(s) is/are 1, 5, 9 and 13-26.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☒ to Paper No./Mail Date 3.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

DETAILED ACTION

Drawings

1. The drawings were received on 16 March 2003. New figure 11 is not in compliance and contains hand drawn figures and is dark. These drawings are not approved. The applicant is required to submit new drawing corrections that are compliant with the USPTO form 948 rejections of 22 February 2002, and 9 December 2003 under 37 CFR 1.84. Corrections to the drawings are required.
2. The drawings are objected to because of drawing errors found under 37 CFR 1.84, or 37 CFR 1.152, see the attached USPTO form 948 of 9 December 2003 in paper 8. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Response to Amendment

3. The second RCE including the second preliminary amendment to the application has been entered in the image file. The applicant has amended claims 1, 5, and 9 and added new claims 19-26 in the instant application. The applicant canceled claims 2-4, 6-8, and 10-12. Independent claims 1, 5, and 9 were previously allowed. The drafts person has previously rejected the replacement drawings that were submitted by the applicant on 16 March 2004 and in paper 7 on 9 December 2003.

Prior Art

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

I. Art A of Partyka et al., US 6,131,071 in class 702/016 is cited for the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and applies the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

II. Art B of Sudhakar et al., US 6,055,482 in class 702/016 is cited for the method of seismic signal processing and seismic analysis for identifying subterranean features using a coherence analysis to produce an earth model and determine the litho structure 27 in figure 1 and figure 5 and flattens the prestack migrated gather at the horizon of interest with the curves placed at the same horizontal level in lines 15-40 of column 10.

Allowable Subject Matter

5. Claims 1, 5, 9, 13-26 are allowed.

6. The following is an examiner's statement of reasons for allowance:

I. With regard to claim 1, the prior art of record does not disclose or suggest the claimed combination of method steps. Most particularly the claimed steps of "receiving a plurality of traces representative of the waves propagating through the fractured zone...[and] a first portion of the seismic traces corresponding to a first window above

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the fracture zone...[and] a second portion of the seismic traces corresponds to a second window located below the fracture zone” or the particularly claimed steps involved with “generating a first and second frequency spectrum associated with the first and second portions corresponding to the first and second windows...[and] superimposing the first spectrum onto the second frequency spectrum...[and] generating a superimposed frequency spectrum...[and] defining from the superimposed frequency spectrum a high and low frequency to determine the plurality of amplitude values” or the particularly claimed steps in using “the plurality of signal amplitudes to define a (t) time attribute by subtracting the natural log of the ratio of F_a to F_b to derive and define the defined high frequency less the defined low frequency” ...[and] providing for the plotting of the time attribute on a data map and assigning a unique color to the time attribute and in this combination is not found in the cited art of record.

The prior Art A of Partyka et al., US 6,131,071 teaches the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and teaches reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and teaches the application of the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

The prior art B of Sudhakar et al., US 6,055,482 teaches the method of seismic signal processing and provides seismic analysis for identifying the subterranean features using a coherence analysis to produce an earth model and teaches a method to determine the litho structure 27 in figure 1 and figure 5 and teaches flattening the

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prestack migrated gather at the horizon of interest with the seismic curves placed at the same horizontal level in lines 15-40 of column 10.

Therefore, the prior art Partyka et al., and The prior art of Sudhakar et al., in combination or alone does not teach the present limitation of the claimed combination limitation.

Claims 13-14 which are dependent on the allowed independent claims 1, 5, and 9 are allowed at least for the reason cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

II. With regard to claim 5, the prior art of record does not disclose or suggest the claimed combination of system steps. Most particularly the claimed program storage device tangibility embodying a computer program to perform the following method steps as recited in claim 1 that of "receiving a plurality of traces representative of the waves propagating through the fractured zone...[and] a first portion of the seismic traces corresponding to a first window above the fracture zone...[and] a second portion of the seismic traces corresponds to a second window located below the fracture zone" or the particularly claimed steps involved with "generating a first and second frequency spectrum associated with the first and second portions corresponding to the first and second windows...[and] superimposing the first spectrum onto the second frequency spectrum...[and] generating a superimposed frequency spectrum...[and] defining from the superimposed frequency spectrum a high and low frequency to determine the plurality of amplitude values" or the particularly claimed steps in using "the plurality of

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signal amplitudes to define a (t) time attribute by subtracting the natural log of the ratio of F_a to F_b to derive and define the defined high frequency less the defined low frequency" ...[and] providing for the plotting of the time attribute on a data map and assigning a unique color to the time attribute and in this combination is not found in the cited art of record.

The prior Art A of Partyka et al., US 6,131,071 teaches the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and teaches reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and teaches the application of the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

The prior art B of Sudhakar et al., US 6,055,482 teaches the method of seismic signal processing and provides seismic analysis for identifying the subterranean features using a coherence analysis to produce an earth model and teaches a method to determine the litho structure 27 in figure 1 and figure 5 and teaches flattening the prestack migrated gather at the horizon of interest with the seismic curves placed at the same horizontal level in lines 15-40 of column 10.

Therefore, the prior art Partyka et al., and The prior art of Sudhakar et al., in combination or alone does not teach the present limitation of the claimed combination limitation.

Claims 15-16 which are dependent on the allowed independent claims 1, 5, and 9 are allowed at least for the reason cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

III. With regard to claim 9, the prior art of record does not disclose or suggest the claimed apparatus adapted for detecting fractures comprising most particularly the claimed first means of "receiving a plurality of traces representative of the waves propagating through the fractured zone... [and] a first portion of the seismic traces corresponding to a first window above the fracture zone... [and] a second portion of the seismic traces corresponds to a second window located below the fracture zone" or the particularly claimed means involved with "generating a first and second frequency spectrum associated with the first and second portions corresponding to the first and second windows... [and] means of superimposing the first spectrum onto the second frequency spectrum... [and] means of generating a superimposed frequency spectrum... [and] means of defining from the superimposed frequency spectrum a high and low frequency to determine the plurality of amplitude values" or the particularly claimed means in using "the plurality of signal amplitudes to define a (t) time attribute by subtracting the natural log of the ratio of Fa to Fb to derive and define the defined high frequency less the defined low frequency"... [and] means of providing for the plotting of the time attribute on a data map and assigning a unique color to the time attribute and in this combination is not found in the cited art of record.

The prior Art A of Partyka et al., US 6,131,071 teaches the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and teaches

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reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and teaches the application of the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

The prior art B of Sudhakar et al., US 6,055,482 teaches the method of seismic signal processing and provides seismic analysis for identifying the subterranean features using a coherence analysis to produce an earth model and teaches a method to determine the litho structure 27 in figure 1 and figure 5 and teaches flattening the prestack migrated gather at the horizon of interest with the seismic curves placed at the same horizontal level in lines 15-40 of column 10.

Therefore, the prior art Partyka et al., and The prior art of Sudhakar et al., in combination or alone does not teach the present limitation of the claimed combination limitation.

Claims 17-18 which are dependent on the allowed independent claims 1, 5, and 9 are allowed at least for the reason cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

IV. With regard to claim 19, the prior art of record does not disclose or suggest the claimed combination of method steps. Most particularly the claimed steps of "generating a first and second frequency spectrum associated with the first and second portions corresponding to the first and second windows... [and] defining an amplitude Fa (high)... [and] an amplitude Fa (low)... [and] an amplitude Fb (high) of the second frequency spectrum at the defined high frequency, and an amplitude Fb (low) of the

second frequency spectrum at the defined low frequency” or the particularly claimed steps in using “scaling by dividing the difference” or the particularly claimed steps in “mapping the t^* attribute” and in this combination is not found in the cited art of record.

The prior Art A of Partyka et al., US 6,131,071 teaches the seismic spectral decomposition for seismic interpretation of processing seismic data to provide thin bed tuning effects of later rock discontinuities using source wavelets P1 and teaches reflected wavelets R2 in figure 1-B for spectral decomposition in figure 6 at depth and teaches the application of the Gaussian weight function in figure 8 to determine the frequency components in line 2 of column 12.

The prior art B of Sudhakar et al., US 6,055,482 teaches the method of seismic signal processing and provides seismic analysis for identifying the subterranean features using a coherence analysis to produce an earth model and teaches a method to determine the litho structure 27 in figure 1 and figure 5 and teaches flattening the prestack migrated gather at the horizon of interest with the seismic curves placed at the same horizontal level in lines 15-40 of column 10.

Therefore, the prior art Partyka et al., and The prior art of Sudhakar et al., in combination or alone does not teach the present limitation of the claimed combination limitation.

Claims 20-26 which are dependent on the allowed independent claims 1, 5, and 9 are allowed at least for the reason cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

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7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

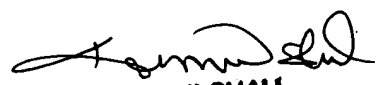
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 517-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VJT


1 April 2004


KAMINI SHAH
PRIMARY EXAMINER

2863